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Assessment of Some Coagulation Profile among Different Tribes Living in Nnewi, Anambra State Nigeria

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ABSTRACT

***Background:** The influences of tribes on coagulation profile have not been sufficiently investigated. However, Genetic factors contribute to the inter individual variation of blood coagulation protein levels (de Lange et al., 2001). This study was aimed to assess some coagulation profile on 420 subjects, age range 18-84years old, consisting of 60 subjects each from the different tribes (Igbo, Yoruba, Hausa, Ibibio, Ijaw, Urhobo and Efik) males and females all residing in Nnewi town, Anambra state Nigeria. Prothrombin Time (PT), Activated Partial Thrombin Time (APTT), Whole blood Clothing Time (CT) and Bleeding Time (BT) were measured among 7 different tribes (Igbo, Yoruba, Hausa, Ibibio, Ijaw, Urhobo and Efik) residing in Nnewi, Anambra state Nigeria. Prothrombin Time (PT) and Activated Partial Thrombin Time (APTT) values showed significant different ($p<0.05$) among the tribes, while Whole blood Clothing Time (CT) and Bleeding Time (BT) showed no significant different ($p>0.05$) among the different tribes. We conclude that tribe (ethnicity) had effect on Prothrombin Time (PT) and Activated Partial Thrombin Time (APTT) values.*

Keywords: *Prothrombin Time, Activated Partial Thrombin Time, Clothing Time, Bleeding Time, Tribe and Nnewi.*

INTRODUCTION

Tribe is a socially, ethnically, and politically cohesive group of people having a common character, occupation, or interest (1). Some have chosen to use the terms "ethnic group" or "nation" instead (2). Currently there are many tribes in Nigeria, and they usually function in harmony with each other, but at the same time all of them are quite different and unique, especially, when it comes to native foods, language and cultural delicacies (3). Different tribes have different opinion about their food, which mainly depends on the ingredients that are produced in their area. Nigerian food culture differs from different tribe to another; and it is expected that each of these tribes would have their own local food. Traditional food systems play significant roles in maintaining the well-being and health of Indigenous Peoples (3).People from these different tribes migrate and resides in Nnewi, Anambra state of Nigeria for greener pasture.

Several nutrients affect coagulation, including vitamin K, which is needed by the liver for synthesis of prothrombin and other coagulation factors that are carboxylated post-translationally (4). Factors II, VII, IX, and X are dependent on Vitamin K for their synthesis. Vitamin K is a fat-soluble vitamin that is consumed in the diet and synthesized by bacteria in the intestinal tract. Dietary deficiencies or malabsorption syndromes may also result in low availability of Vitamin K. Because factor VII has the shortest half-life, a deficiency in this factor will rapidly result in a prolongation of PT (5).

The prothrombin time (PT) evaluates mainly defects in the extrinsic coagulation system. It is

used as a liver function test and as a general screening tool for coagulation disorders. The prothrombin time measures factors VII, X, V, and prothrombin (6). The normal time is 10–14 Seconds. When PT is used to monitor anticoagulation therapy with warfarin, the international normalized ratio (INR) is preferred because of its ability to standardize varied thromboplastin reagents (6)

APTT tests the intrinsic pathway (also called the amplification pathway or contact system), which includes factors XII, XI, IX, VIII, X, V, and II. The activated partial thromboplastin time measures factors VIII, IX, XI, and XII, and the normal time is 25 - 40 seconds (7). There are differences in the concentration of individual coagulation factors between species, and inter-species differences in sensitivity to various test.

Clotting time is a complex process being regulated by platelets count and activity. The core function of platelets is the formation of mechanical plugs during the normal haemostatic response to vascular injury. A decrease platelets count or inactivity will alter the body response to prompt wound healing processing (8).

The bleeding time reflects the function of platelet in vivo, and is the duration of blood flow from a standardized incision on the surface of the forearm (9).

With advancing age, many individuals who are otherwise normal show laboratory evidence of increase of coagulation enzyme activity. Coagulation and fibrinolytic activities are under strong genetic control (10). Genetic factors contribute to the interindividual variation of blood coagulation protein levels (11). When the genes controlling the production of coagulation factors are mutated, abnormal results are obtained. Hence the need to assess some coagulation profile of the different tribes living in Nnewi, Anambra state, Nigeria.

MATERIAL AND METHOD

Four hundred and twenty subjects, age range 18-84years old were used for the study. They consist of 60 subjects each from the different tribes (Igbo, Yoruba, Hausa, Ibibio, Ijaw, Urhobo and Efik) and made up of males and females all residing in Nnewi.

Five milliliter (5ml) ml of venous blood was collected with a 10ml syringe and 21G needle, 2 ml of the blood was dispensed into sodium citrate bottle for prothrombin test (time, index, INR) and activated partial prothrombin test (time and ratio) carried out using CA-1500 (Sysmex, Kobe, Japan), using appropriate quality control materials and standard reagents (Dade Behring, Germany), PT (normal range: 9.1 - 11.9 sec) and APTT (normal range: 19.98 - 30.93 sec). Three milliliters were used for clotting time (Lee and white method), 1 ml of blood was added in 3 different plain tubes fixed in a rack previously placed in a water bathat a temperature of 37ºC, each bottle was tilted to check for the sign of blood clot every 30 sec. using a stop watch, the time interval between blood collection and the time the clot appeared in each test tube was recorded in minutes. The average of the three reading was taken as the clothing time for each subject. The bleeding time (BT) was performed by Ivy's modified template method, sphygmomanometer cuff was wrapped around the upper arm and inflated to a pressure of 40mms of mercury and maintained throughout the test. The forearm was cleansed with alcohol pad and allowed to dry skin punctures were made on the anterior side avoiding superficial vein. The stop watch was started immediately the first puncture was made.

The blood from the wound was then removed at regular intervals (15-30secs) using the edge of a filter paper, making sure not to touch the wound. The time taken for each bleed from to stop was noted separately and the average time taken (12).

RESULT

The table below revealed significant differences (P=0.03) in the mean ± SD PT (secs.) result values among the tribes. The Igbo subjects (15.90 ± 1.68), the Efik subjects(15.20 ±1.21), the Urhobo subjects (15.84 ±1.19), and the Ijaw subjects (15.25±1.28) had higher PT test values than subjects from Yoruba (14.88 ± 1.41), Edo(14.33 ± 1.25) and Hausa (13.80 ± 1.34). The mean ± SD of APT ratio value showed that 0.96 ± 0.19 for Igbo subjects, 0.99 ± 0.15 for Urhobo subjects, 0.95 ± 0.10 for the Ijaw subjects, 0.94 ± 0.15 for Efik subjects, and 0.90 ± 0.12 for Yoruba subjects, were higher than the mean values for Ibibio subjects (0.88 ± 0.17), and for the Hausa subjects (0.83 ± 0.13). There weresignificant differences in their mean values (P=0.03) (table below). The different tribes PT index value,PT- INR value, APTT values, APT ratio value APT ratio value, Clotting time and bleeding time values, showed no significant differences in their mean values as shown on the table below.

Table1. *Coagulation Profile (Pt, Pt Index, Inr, Aptt, Aptt-Ratio, Clotting and Bleeding Time) Values Among Different Tribes Residing In Nnewi And Environs.*

HAEMATOLOGICAL PARAMETERS	IGBO (n=60)	YORUBA (n=60)	IBIBIO (n=60)	EFIK (n=60)	HAUSA (n=60)	URHOBO (n=60)	IJAW (n=60)	P VALUES
PT (secs)	15.90±1.68	14.88±1.41	14.33±1.25	15.20±1.21	13.80±1.34	15.84± 1.19	15.25± 1.28	0.04*
PT- INDEX	86.04±10.04	85.91±8.95	86.78±5.96	81.20±9.91	92.22±8.49	88.60±9.43	90.56±8.56	0.32
PT-INR	1.17±0.17	1.15±0.16	1.16±0.08	1.04±0.37	1.08±0.12	1.17±0.45	1.15±0.12	0.21
APTT(secs)	28.45±5.85	27.00±3.69	26.78±4.95	27.80±4.65	25.56±3.90	28.70±5.48	26.38± 1.96	0.12
APTT-RATIO	0.96±0.19	0.90±0.12	0.88±0.17	0.94±0.15	0.83±0.13	0.99±0.15	0.95±1.10	0.03*
CLOTTING TIME (mins)	4.54±1.20	4.38±0.73	4.41±0.52	4.48±0.61	4.34±0.29	4.68± 0.52	4.42±0.49	0.88
BLEEDING TIME (mins)	1.48±0.48	1.54±0.41	1.54±0.37	1.51±0.48	1.32±0.16	1.53±0.29	1.52±0.32	0.77

*Data is expressed as mean ± SD; * Significant (P <0.05)*

DISCUSSION

Different tribes (Igbo, Yoruba, Hausa, Ibibio, Ijaw, Urhobo and Efik) residing in Nnewi Anambra state coagulation profile were analyzed using their blood samples. Prothrombin time (PT) and Activated partial thrombin time test values were significantly different(P= 0.04 and 0.03 respectively). PT assesses the extrinsic pathway which involves the factorsVII, X, V, 11, vitamin $B_{12}$and platelets. These coagulation factors are proteins and released into the blood by the liver. Protein is a vital nutrient because of its role in building and maintaining body tissues, but they are regarded as rich man food. Vitamin K is required for the synthesis of some of these factors. (Food sources of vitamin K include leafy vegetables, cheese, asparagus, bacon, coffee, and green tea.) vitamin K is found in large quantities in the photosynthetic tissues of plants (green leaves, and dark green leafy vegetables such as romaine lettuce, kale, and spinach), but it occurs in far smaller quantities in other plant tissues roots, fruits, etc.Most of the local food consumed by these tribes is either rich in protein or poor in protein content.These differences were attributed to the different values obtained from the investigation. Although despite abundant vegetable and fruits eaten by these tribes, a considerable amount of minerals and vitamins in them are lost through excessive cooking. The major dietary intake among the Igbo and the Urhobo are mostly carbohydrate in different forms, like rice, yam, garri, other cassava products (akpo and abacha), and so the variations of these parameters (PT and APTT) in this study can also be attributed to the dietary, environmental, genetic factors, socio-economical factors or a combination of these factors, which can cause low dietary intake of nutrients (iron, folates and vitamin B12) (13).

CONCLUSION

The differences in PTand APTT values observed in different tribes might be due to genetics make up of the individual from the different tribes and their dietary intake of the subjects.

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